

# Notice of Allowability

Application No.

10/735,121

Examiner

Robert J. Hoffberg

Applicant(s)

MONGIA ET AL.

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/3/06.
2. ☒ The allowed claim(s) is/are 1-15, 17-22, 24, 27 and 28.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

**MICHAEL DATSKOVSKIY**  
**PRIMARY EXAMINER**

*Michael Datskovskiy*  
11/29/06

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Alan Pedersen-Giles, Reg. No. 39,996 on 11/28/06.

2. Change Claim 10, line 10 from "enclosed channels" to --parallel enclosed channels--.
3. Change Claim 19, line 9 from "upper channels" to --linear upper channels--.

### REASONS FOR ALLOWANCE

4. The claims 1-9 are allowable over the prior art of record for at least the reason that the prior art fails to teach or suggest a structure as in claim 1, comprising a integrated circuit chip and enclosed channels that extend in parallel lines along an entire length of the integrated circuit chip, wherein a density of the channels changes abruptly twice across the length of the integrated circuit chip. The aforementioned limitations in combination with all remaining limitations of the respective claims are believed to render said independent claims 1 and all claims dependent therefrom patentable over art of record.

5. The claims 10-15 and 17-18 are allowable over the prior art of record for at least the reason that the prior art fails to teach or suggest a structure as in claim 10, comprising a semiconductor base including areas of higher and lower power density

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areas, a heat exchange layer including parallel enclosed channels and an upper heat exchange layer including parallel upper channels, wherein the density of the parallel enclosed channels over the area of higher power density is higher than the density of the parallel enclosed channels over the area of lower power density. The aforementioned limitations in combination with all remaining limitations of the respective claims are believed to render said independent claims 10 and all claims dependent therefrom patentable over art of record.

6. The claims 19-22 and 24 are allowable over the prior art of record for at least the reason that the prior art fails to teach or suggest a structure as in claim 19, comprising an integrated circuit chip including linear enclosed channels, wherein an average width of the linear enclosed channels substantially changes along a length of the channel; and a heat exchanger layer including linear upper channels, wherein an average width of the linear upper channels substantially changes along a length of the upper channels. The aforementioned limitations in combination with all remaining limitations of the respective claims are believed to render said independent claims 19 and all claims dependent therefrom patentable over art of record.

7. The claims 27-28 are allowable over the prior art of record for at least the reason that the prior art fails to teach or suggest a method as in claim 27 comprising forming first parallel channels on a semiconductor device and second parallel channels adjacent to one end of the first parallel channels, in the same direction and having a greater average width than the first parallel channels. The aforementioned limitations in combination with all remaining limitations of the respective claims are believed to render

said independent claims 27 and all claims dependent therefrom patentable over art of record.

8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

9. None of the cited references, either taken alone or in combination is believed to render the present invention unpatentable as claimed.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Azar (US 6,263,955) in Fig. 23C teaches a heat exchanger with first parallel channels and second parallel channels adjacent to one end of the first parallel channels, in the same direction and having a greater average width than the first parallel channels. Swift et al. (US 4,516,632) and Prasher et al. (US 6,903,929) teach a first second heat exchange layers, each having parallel enclosed channels. Bezama et al. (US 7,139,172) and Chang et al. (US 2006/0226539) teach parallel channels having different densities, but their filing dates post date the applicant's filing date.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**MICHAEL DATSKOVSKIY**  
**PRIMARY EXAMINER**

RJH *RM*

*Michael Datskovskiy*  
11/29/06